

WHAT IS CLAIMED IS:

1. A method of manufacturing a semiconductor device, comprising the steps of:

(a) providing a semiconductor chip having a plurality of salient electrodes formed by conductors including gold;

(b) providing a wiring substrate, said wiring substrate comprising a thin film base formed by an insulator including an organic resin and a plurality of leads formed on said thin film base correspondingly to said plural salient electrodes; and

(c) bonding said plural salient electrodes formed on said semiconductor chip respectively to said plural leads formed on said wiring substrate,

wherein, in said wiring substrate provided in said step (b), the pitch of said plural salient electrodes is larger than the pitch of said leads at the portions corresponding respectively to the plural salient electrodes, and

wherein said plural leads are fixed to said thin film base at their portions to be bonded to said salient electrodes.

2. The method according to claim 1, wherein the bonding between said salient electrodes and said leads in said step (c) is performed by forming Au-Sn eutectic bond between the

two.

3. The method according to claim 1, wherein the bonding between said salient electrodes and said leads in said step (c) is performed by forming Au-Au bond between the two.

4. The method according to claim 1, wherein the bonding between said salient electrodes and said leads in said step (c) is performed at a temperature of not higher than the glass transition temperature of said insulator which constitutes said thin film base.

5. The method according to claim 1, wherein said thin film base is flexible.

6. The method according to claim 1, wherein the bonding between said salient electrodes and said leads in said step (c) is performed while the portion of said wiring substrate located around an area where the bonding is performed is held grippingly by means of a jig.

7. The method according to claim 6, wherein the bonding between said salient electrodes and said leads in said step (c) is performed by bringing the salient electrodes and the leads into contact with each other while heating said semiconductor chip to a temperature higher than the temperature of said wiring substrate.

8. The method according to claim 1, wherein the bonding between said salient electrodes and said leads in said step

(c) is performed by bringing the salient electrodes and the leads into contact with each other while heating said semiconductor chip to a temperature higher than the temperature of said wiring substrate with use of a jig.

9. The method according to claim 8, wherein the temperature of said jig for heating said semiconductor chip is not lower than the glass transition temperature of said insulator which constitutes said thin film base.

10. The method according to claim 9, wherein the temperature of said wiring substrate before the contact between said salient electrodes and said leads is not higher than the glass transition temperature of said insulator which constitutes said thin film base.

11. The method according to claim 1, wherein said step (c) includes a step of pushing said wiring substrate by means of a jig to bring said leads into contact with said salient electrodes, said step of pushing the wiring substrate by said jig being carried out while allowing the wiring substrate to be interposed between the leads-salient electrodes contact portion and said jig.

12. A method of manufacturing a semiconductor device, comprising the steps of:

(a) providing a semiconductor chip, said semiconductor chip having a rectangular main surface and a plurality of

salient electrodes formed on said main surface;

(b) providing a wiring substrate, said wiring substrate having a thin film base formed by an insulator and also having a plurality of leads corresponding respectively to said plural salient electrodes of said semiconductor chip; and

(c) bonding said plural salient electrodes to said plural leads respectively,

wherein, in said wiring substrate provided in said step (b), the pitch of said plural salient electrodes is smaller than the pitch of said leads at the portions corresponding respectively to the plural salient electrodes,

wherein said plural leads are fixed to said thin film base at their portions to be bonded to said salient electrodes, and

wherein said step (c) includes a step of positioning said wiring substrate and said semiconductor chip to predetermined positions while keeping the two spaced apart from each other, a step of holding the portion of said wiring substrate located around an area where the bonding between said salient electrodes and said leads is performed, grippingly by means of a jig, while keeping the wiring substrate and the semiconductor chip spaced apart from each other, and a step of pushing said wiring substrate by said

jig to bring said leads into contact with said salient electrodes while keeping the wiring substrate and said semiconductor chip spaced apart from each other.

13. A method of manufacturing a semiconductor device, comprising the steps of:

(a) providing a semiconductor chip, said semiconductor chip having: a rectangular main surface; a plurality of first salient electrodes formed near corners of said rectangular main surface and including gold; and a plurality of second salient electrodes disposed near a longitudinally mid point of said rectangular main surface and including gold;

(b) providing a wiring substrate, said wiring substrate having an insulating thin film substrate including an organic resin and also having a plurality of leads formed correspondingly to said first and second plural salient electrodes; and

(c) bonding said first and second plural salient electrodes to said plural leads respectively,

wherein, in said wiring substrate provided in said step (b), the pitch of said first plural salient electrodes is smaller than the pitch of said plural leads at the portions corresponding respectively to the plural salient electrodes,

wherein said leads to be bonded to said salient electrodes in said step (c) are fixed onto said thin film base, and

wherein said step (C) includes a step of disposing said wiring substrate and said semiconductor chip apart from each other, a step of holding grippingly the portion of said wiring substrate located around an area where the semiconductor chip is disposed while keeping the wiring substrate and the semiconductor chip spaced apart from each other, and a subsequent step of pushing said wiring substrate to bring said plural leads into contact with said plural salient electrodes while keeping the wiring substrate and the semiconductor chip spaced apart from each other.

14. A method of manufacturing a semiconductor device, comprising the steps of:

(a) providing a semiconductor chip, said semiconductor chip having a main surface and a plurality of salient electrodes formed on said main surface;

(b) providing a wiring substrate, said wiring substrate having a thin film base formed by an insulator and also having a plurality of leads corresponding respectively to said plural salient electrodes of said semiconductor chip; and

(c) bonding said plural salient electrodes to said plural leads respectively, wherein, in said wiring substrate provided in said step (b), the pitch of said plural salient electrodes is smaller than the pitch of said leads at the portions corresponding respectively to the plural salient electrodes,

wherein said plural leads are fixed to said thin film base at their portions to be bonded to said salient electrodes, and

wherein said step (c) includes a step of positioning said wiring substrate and said semiconductor chip to predetermined positions while keeping the two spaced apart from each other, a step of holding the portion of said

wiring substrate located around an area where the bonding between said salient electrodes and said leads is performed, grippingly by means of a jig, while keeping the wiring substrate and the semiconductor chip spaced apart from each other, and a step of pushing said wiring substrate by said jig to bring said leads into contact with said salient electrodes.

15. The method according to claim 14, wherein the bonding between said salient electrodes and said leads in said step (c) is performed by forming Au-Sn eutectic bond between the two.

16. The method according to claim 14, wherein the bonding between said salient electrodes and said leads in said step (c) is performed by forming Au-Au bond between the two.

17. The method according to claim 14, wherein the bonding between said salient electrodes and said leads in said step (c) is performed at a temperature of not higher than the glass transition temperature of said insulator which constitutes said thin film base.



18. The method according to claim 14, wherein said thin film base is flexible.

19. The method according to claim 14, wherein the bonding between said salient electrodes and said leads in said step (c) is performed by bringing the salient electrodes and the leads into contact with each other while heating said semiconductor chip to a temperature higher than the temperature of said wiring substrate.

20. The method according to claim 14, wherein the bonding between said salient electrodes and said leads in said step (c) is performed by bringing the salient electrodes and the leads into contact with each other while heating said semiconductor chip to a temperature higher than the temperature of said wiring substrate with use of a jig.

21. The method according to claim 14, wherein the temperature of said jig for heating said semiconductor chip is not lower than the glass transition temperature of said insulator which constitutes said thin film base.

22. The method according to claim 14, wherein the temperature of said wiring substrate before the contact between said salient electrodes and said leads is not higher than the glass transition temperature of said insulator which constitutes said thin film base.